Amendments to the Specification

Please replace the paragraph beginning at page 1, line 5, with the following rewritten paragraph:

Benefit is claimed, under 35 U.S.C. § 119(e)(1), to the filing date of: provisional patent application serial number ~~__/___,___~~ 60/294,877, entitled "PMM: A PIPELINED MAXIMAL-SIZED MATCHING SCHEDULING APPROACH FOR INPUT-BUFFERED SWITCHES", filed on May 31, 2001 and listing Eiji Oki, Roberto Rojas-Cessa and Jonathan Chao as the inventors, for any inventions disclosed in the manner provided by 35 U.S.C. § 112, ¶ 1. This provisional application is expressly incorporated herein by reference.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 Claim 1 (original): For use with a switch having a first
2 number of input ports, a second number of output ports,
3 each of the input ports having the second number of virtual
4 output queues, and a third number of subschedulers, each of
5 the third number of subschedulers being able to arbitrate
6 matching to each of the second number of output ports, a
7 method for scheduling the dispatch of cells or packets
8 stored in the virtual output queues, the method comprising:
9   a) for each of the virtual output queues, maintaining
10   a first indicator for indicating whether the virtual
11   output queue is storing a cell awaiting dispatch
12   arbitration;
13   b) for each of the subschedulers, maintaining a
14   second indicator $F(i,j,k)$ for indicating whether the
15 . subscheduler is available or reserved; and
16   c) for each of the subschedulers, performing a
17   matching operation, if it has been reserved, to match
18   a cell buffered at a virtual output queue with its
19   corresponding output port,
20   wherein each of the subschedulers requires more
21 than one cell time slot to generate a match from its
22 matching operation, and
23   wherein the subschedulers can collectively
24 generate a match result for each output port in each cell
25 time slot.

1 Claim 2 (original): The method of claim 1 wherein each of
2 the subschedulers requires the third number of cell time
3 slots to generate a match from its matching operation.

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1 Claim 3 (original): The method of claim 1 wherein each of
2 the subschedulers require no more than the third number of
3 cell time slots to generate a match results from its
4 matching operation.

1 Claim 4 (original): The method of claim 1 wherein fairness
2 for best-effort traffic is maintained.

1 Claim 5 (currently amended): The method of claim 1 wherein
2 the matching operation is a matching operation selected
3 from a group of matching operations consisting of (A) Dual
4 Round-Robin Matching ~~DRRM~~, and (B) iterative-SLIP ~~iSLIP~~.

1 Claim 6 (original): The method of claim 1 further
2 comprising:
3   d) if a cell buffered at a virtual output queue has
4   been successfully matched with its corresponding
5   output port, informing the virtual output queue.

1 Claim 7 (original): The method of claim 6 further
2 comprising:
3   e) for each of the virtual output queues, if the
4   virtual output queue has been informed that it has
5   been successfully matched with its corresponding
6   output port, then dispatching its head of line cell.

1 Claim 8 (original): The method of claim 7 wherein the head
2 of line cell is dispatched in a next cell time slot.

1 Claim 9 (original): The method of claim 1 further
2 comprising:

3   e)   if a cell buffered at a virtual output queue has

4   been successfully matched with its corresponding

5   output port, then dispatching its head of line cell.

1   Claim 10 (original): The method of claim 9 wherein the

2   head of line cell is dispatched in a next cell time slot.

1   Claim 11 (original): The method of claim 1 wherein the

2   first indicator, for each of the virtual output queues, for

3   indicating whether the virtual output queue is storing a

4   cell awaiting dispatch, is a count,

5   wherein the count is incremented upon learning

6   that a new cell has arrived at the virtual output queue.

1   Claim 12 (original): The method of claim 11 wherein the

2   count is decremented when an available subscheduler is

3   reserved for considering a head of line cell at a

4   corresponding virtual output queue.

1   Claim 13 (original): The method of claim 1 wherein the

2   second indicator, for each of the subschedulers, is set to

3   indicate that the associated subscheduler is reserved if

4   the first indicator indicates that a corresponding virtual

5   output queue is storing a cell awaiting dispatch

6   arbitration.

1   Claim 14 (original): The method of claim 1 wherein the

2   second indicator, for each of the subschedulers, is set to

3   indicate that the associated subscheduler is available if

4   the associated subscheduler matches a cell buffered at a

5   virtual output queue with its corresponding output port.

1 Claim 15 (original): The method of claim 1 wherein the
2 second indicator is set to indicate that a kth subscheduler
3 is reserved if the first indicator indicates that a
4 corresponding virtual output queue is storing a cell
5 awaiting dispatch arbitration,
6   wherein k is set to the current cell time slot
7 modulo the third number.

1 Claim 16 (original): For use with a switch including a
2 first number of output ports, a second number of input
3 ports, and the first number of virtual output queues
4 associated with each of the second number of input ports, a
5 dispatch scheduler comprising:
6   a) a third number of subschedulers;
7   b) a first indicator, associated with each of the
8   virtual output queues, for indicating whether the
9   virtual output queue is storing a cell awaiting
10   dispatch arbitration; and
11   c) a second indicator, for each of the subschedulers,
12   indicating whether the subscheduler is available or
13   reserved,
14   wherein each of the subschedulers is adapted to
15 perform a matching operation, if it has been reserved, to
16 match a cell buffered at a virtual output queue with its
17 corresponding output port,
18   wherein each of the subschedulers requires more
19 than one cell time slot to generate a match from its
20 matching operation, and
21   wherein the subschedulers can collectively
22 generate a match result for each output port in each cell
23 time slot.

1　Claim 17 (original):　The dispatch scheduler of claim 16
2　wherein each of the subschedulers requires the third number
3　of cell time slots to generate a match from its matching
4　operation.

1　Claim 18 (original):　The dispatch scheduler of claim 16
2　wherein each of the subschedulers require no more than the
3　third number of cell time slots to generate a match results
4　from its matching operation.

1　Claim 19 (original):　The dispatch scheduler of claim 16
2　wherein fairness for best-effort traffic is maintained.

1　Claim 20 (currently amended):　The dispatch scheduler of
2　claim 16 wherein the matching operation is a matching
3　operation selected from a group of matching operations
4　consisting of (A) Dual Round-Robin Matching ~~DRRM~~, and (B)
5　iterative-SLIP ~~iSLIP~~.

1　Claim 21 (original):　The dispatch scheduler of claim 16
2　wherein if a cell buffered at a virtual output queue has
3　been successfully matched with its corresponding output
4　port, the virtual output queue is so informed.

1　Claim 22 (original):　The dispatch scheduler of claim 16
2　wherein if a cell buffered at a virtual output queue has
3　been successfully matched with its corresponding output
4　port, its head of line cell is dispatched.

1　Claim 23 (original):　The dispatch scheduler of claim 22
2　wherein the head of line cell is dispatched in a next cell
3　time slot.

1 Claim 24 (original): The dispatch scheduler of claim 16
2 wherein the first indicator, for each of the virtual output
3 queues, for indicating whether the virtual output queue is
4 storing a cell awaiting dispatch arbitration, is a count,
5   wherein the count is incremented upon learning
6 that a new cell has arrived at the virtual output queue.

1 Claim 25 (original): The dispatch scheduler of claim 24
2 wherein the count is decremented when an available
3 subscheduler is reserved for considering a head of line
4 cell at a corresponding virtual output queue.

1 Claim 26 (original): The dispatch scheduler of claim 16
2 wherein the second indicator, for each of the
3 subschedulers, is set to indicate that the associated
4 subscheduler is reserved if the first indicator indicates
5 that a corresponding virtual output queue is storing a cell
6 awaiting dispatch arbitration.

1 Claim 27 (original): The dispatch scheduler of claim 16
2 wherein the second indicator, for each of the
3 subschedulers, is set to indicate that the associated
4 subscheduler is available if the associated subscheduler
5 matches a cell buffered at a virtual output queue with its
6 corresponding output port.

1 Claim 28 (original): The dispatch scheduler of claim 16
2 wherein the second indicator is set to indicate that a kth
3 subscheduler is reserved if the first indicator indicates
4 that a corresponding virtual output queue is storing a cell
5 awaiting dispatch,

8

6   wherein k is set to the current cell time slot
7   modulo the third number.

    Claims 29-33 (canceled)

1   Claim 34 (original): For use with a switch having a first
2   number of input ports, a second number of output ports,
3   each of the input ports having the second number of virtual
4   output queues, and a third number of subschedulers, each of
5   the third number of subschedulers being able to arbitrate
6   matching to each of the second number of output ports, a
7   method for scheduling the dispatch of cells or packets
8   stored in the virtual output queues, the method comprising
9   for each of the subschedulers, performing a matching
10 operation, if it has been reserved, to match a cell
11 buffered at a virtual output queue with its corresponding
12 output port,
13   wherein each of the subschedulers requires more
14 than one cell time slot to generate a match from its
15 matching operation,
16   wherein the subschedulers can collectively
17 generate a match result for each output port in each cell
18 time slot, and
19   fairness is maintained for best-effort traffic.

1   Claim 35 (original): The method of claim 34 wherein each
2   of the subschedulers requires the third number of cell time
3   slots to generate a match from its matching operation.

1   Claim 36 (original): The method of claim 34 wherein each
2   of the subschedulers require no more than the third number

3 of cell time slots to generate a match results from its

4 matching operation.

1 Claim 37 (currently amended): The method of claim 34

2 wherein the matching operation is a matching operation

3 selected from a group of matching operations consisting of

4 (A) Dual Round-Robin Matching ~~DRRM~~, and (B) iterative-SLIP

5 ~~iSLIP~~.